South Bay Power Plant NPDES Permit

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INTRODUCTION

- Board requested new information and studies of SBPP in May 24, 2002 letter to Duke Energy.
- September 24, 2002 final study plans developed in consultation with RWQCB staff, DF&G, USFWS, NMFS, and USEPA to answer Board questions.
- Today's presentation is to update the Board on the scope and progress of ongoing studies.
- Duke Energy is on schedule to complete the new studies in the time specified by the RWQCB.

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NPDES Permit Renewal Issues

***Duke** Energy South Bay LLC has applied for a renewal of the South Bay Power Plant's National Pollution Discharge Elimination System (NPDES) Permit No. CA0001368*

- **The Board and staff determined a need for information on several discharge issues.**
- **The staff also determined that, although the intake structure at SBPP has not been changed since the 316(b) demonstration project was completed in 1980, the demonstration study needs to be updated.**

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Integrated 316(a) and 316(b) Studies Approach

Advantages of Integrated Study Approach:

- **Shared data gathering (sampling locations, methods, instrumentation, data sources, etc)**
- **Harmonized data analysis (common data bases, graphical and statistical analysis techniques), and**
- **Adaptive project management (resource scheduling for effectiveness and reduce redundancies, internal status reports, and interim agency reviews).**

South Bay Power Plant
2003 NPDES Studies

- **Agency approved Work Plan includes:**

Discharge Studies *FCWA 316(a)*

- ✓ **Bathymetry and current mapping**
- ✓ **Thermal plume mapping**
- ✓ **Dissolved oxygen, turbidity and pH gradients**
- ✓ **Species distribution and abundance of fish, marine plants (eelgrass) and sediment dwelling organisms**

Intake Studies *FCWA 316(b)*

- ✓ **Entrainment– larval fishes**
- ✓ **Impingement– adult / juvenile fishes, macro-invertebrates, debris**

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Cooling Water Discharge

Clean Water 316(a) BIC Standard:

Discharge conditions that are necessary to protect beneficial uses and to maintain a balanced indigenous community of shellfish, fish and wildlife in the receiving water.

Discharge Assessment Studies

- Agency Working Group adopted Study Plan September 2002
- Installation of sampling stations and temperature, underwater light and sediment monitoring equipment May/June 2003.
- Bathymetry and current surveys begun in July 2003.
- Eelgrass, fish and infaunal surveys begun in July 2003.

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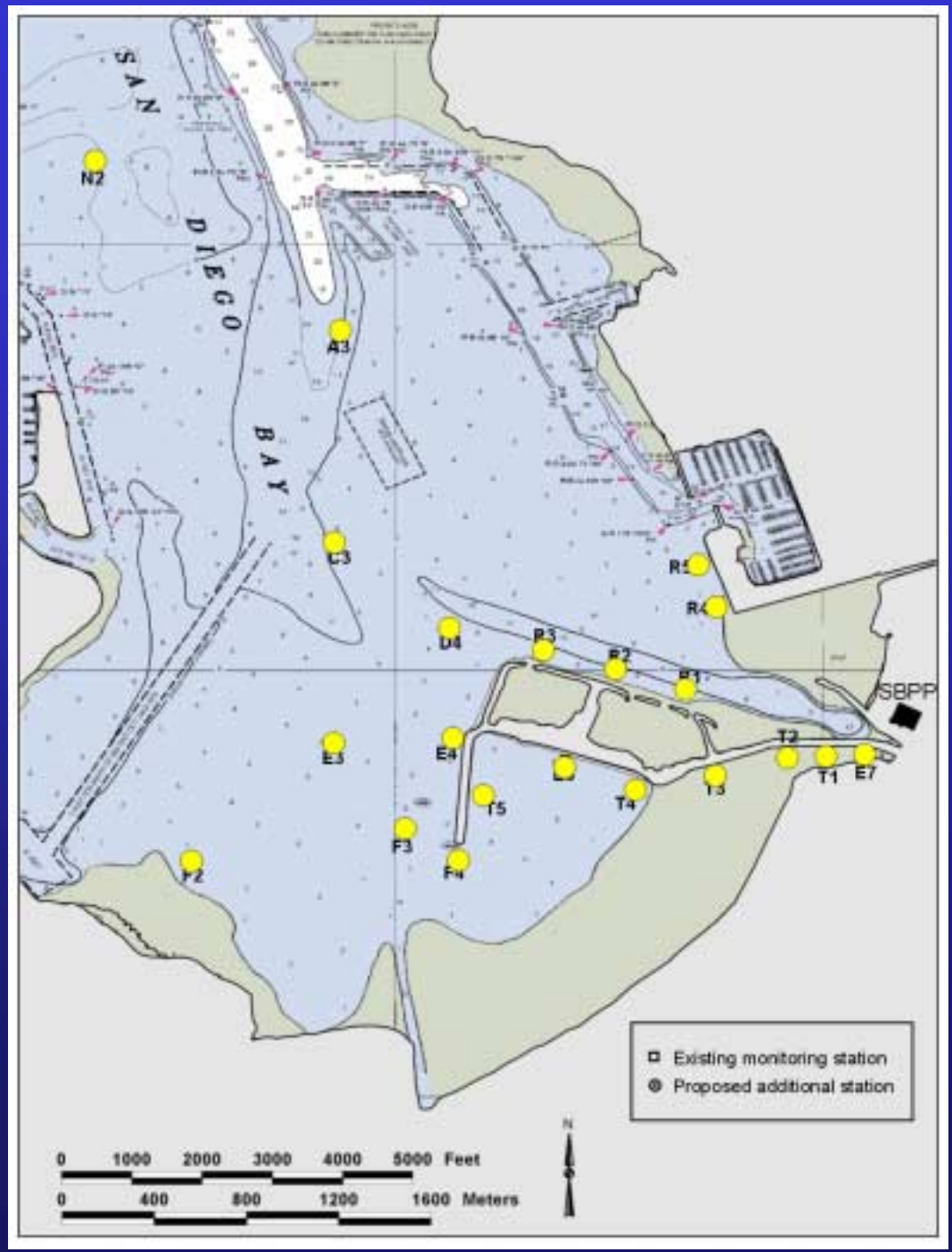

Benthic sampling / Temperature profiles:

- Array of 21 stations in receiving water.
- Sample in warmest months (Jul, Aug, Sep 2003)
- Measure water temps at surface, midwater, and bottom
- Collect intertidal and subtidal benthic faunal samples for gradient analysis

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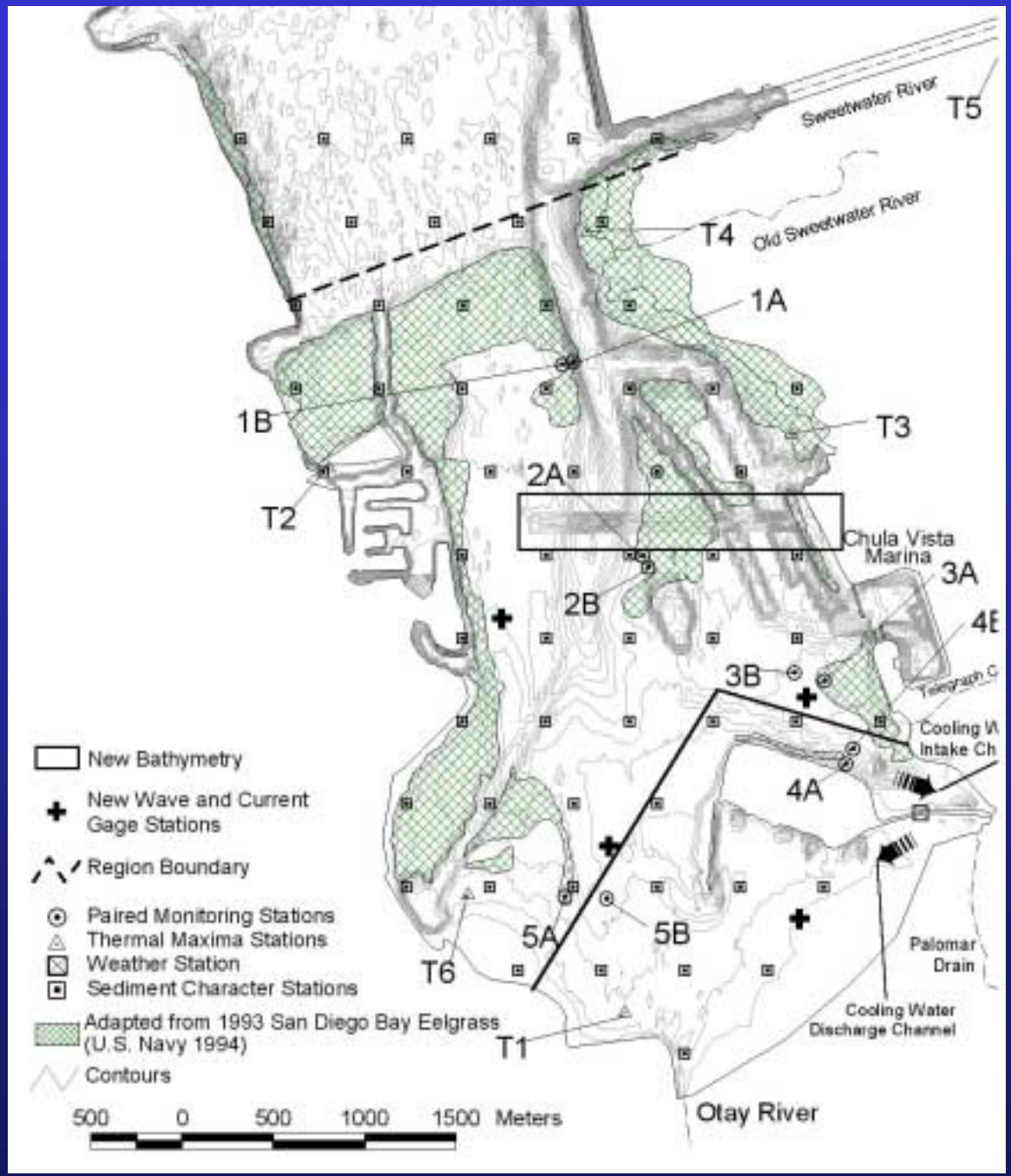

Eelgrass Study Stations

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Dissolved Oxygen Concentration and Fish Abundance Study Areas

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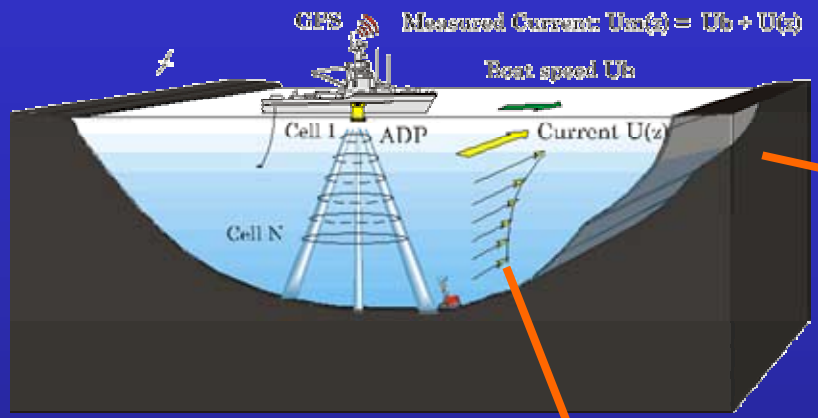
Thermal Plume Studies



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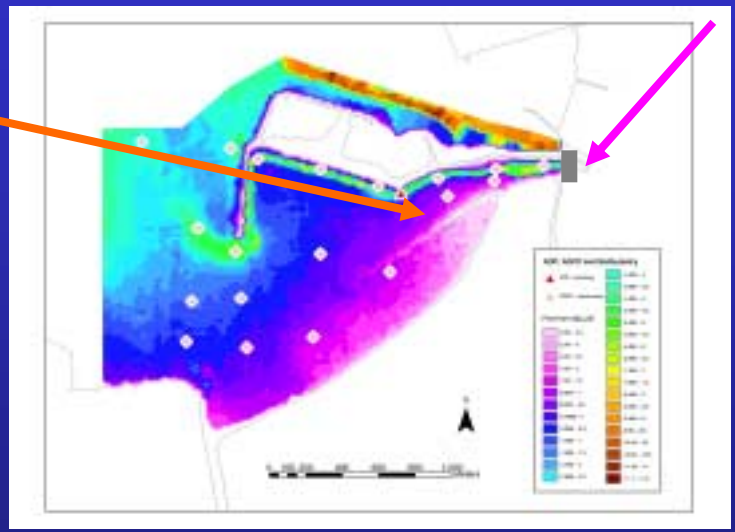
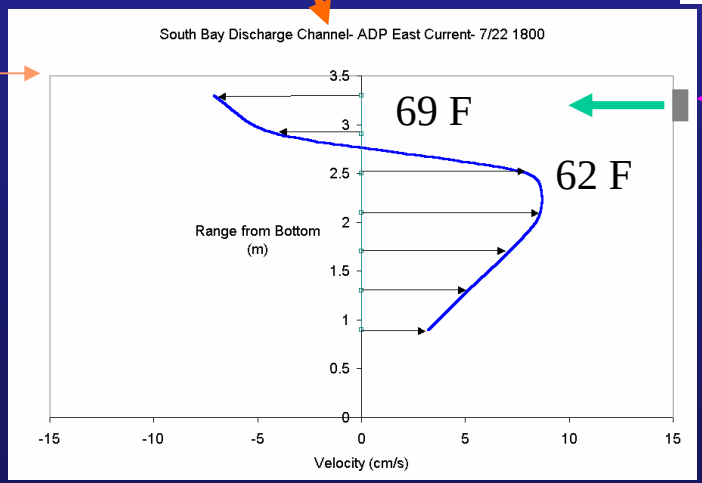
SBPP Discharge



Water Surface



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Cooling Water Intake

Clean Water 316(b) BTA Standard:

Provides that the location, design, construction, and capacity of cooling water intake structures must reflect the best technology available (BTA) for minimizing adverse environmental impacts.

The concept of BTA incorporates economic and technological feasibility. BTA does not include technologies whose cost of implementation is wholly disproportionate to the alternative's environmental benefit.

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316(b) Resource Assessment Study

- Agency Working Group adopted Study Plan September 2002.
- Entrainment and Source Water Sampling begun in January 2001 will be completed November 2003.
- Impingement Sampling of juvenile and adult organisms (and debris) collected on intake screens begun January 2003 will be completed December 2003.

SBPP 316(b) Entrainment Studies
Ichthyoplankton Sampling

Purpose:

Evaluate potential impacts of entrainment losses of larval fish on source water populations by estimating the fractional losses. A two step process:

1. *Quantify the abundance and distribution of larval fishes in the source water (south and south-central portions of San Diego Bay).*
2. *Compare source water abundance to concentrations of larvae entrained by SBPP CWIS.*

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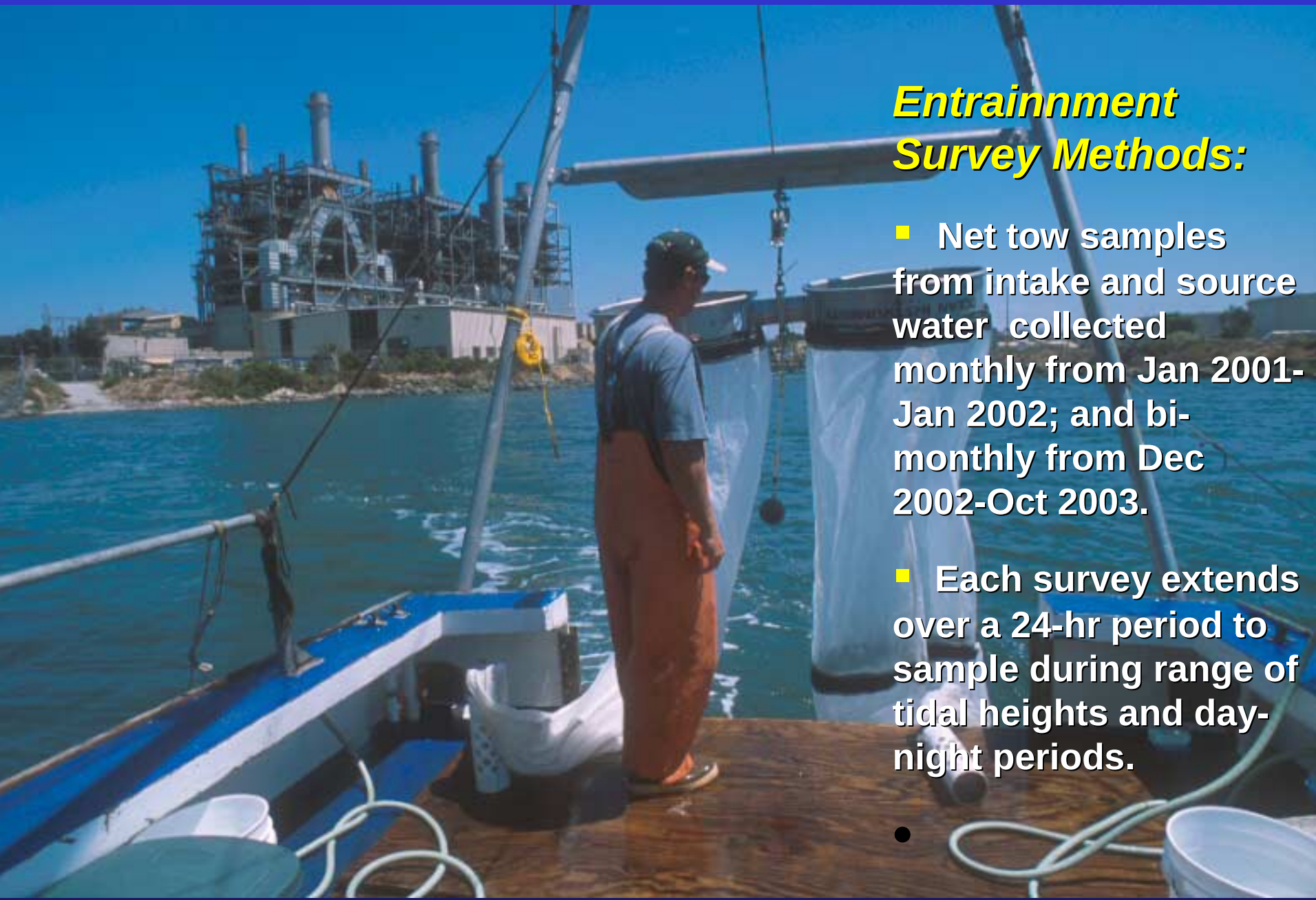
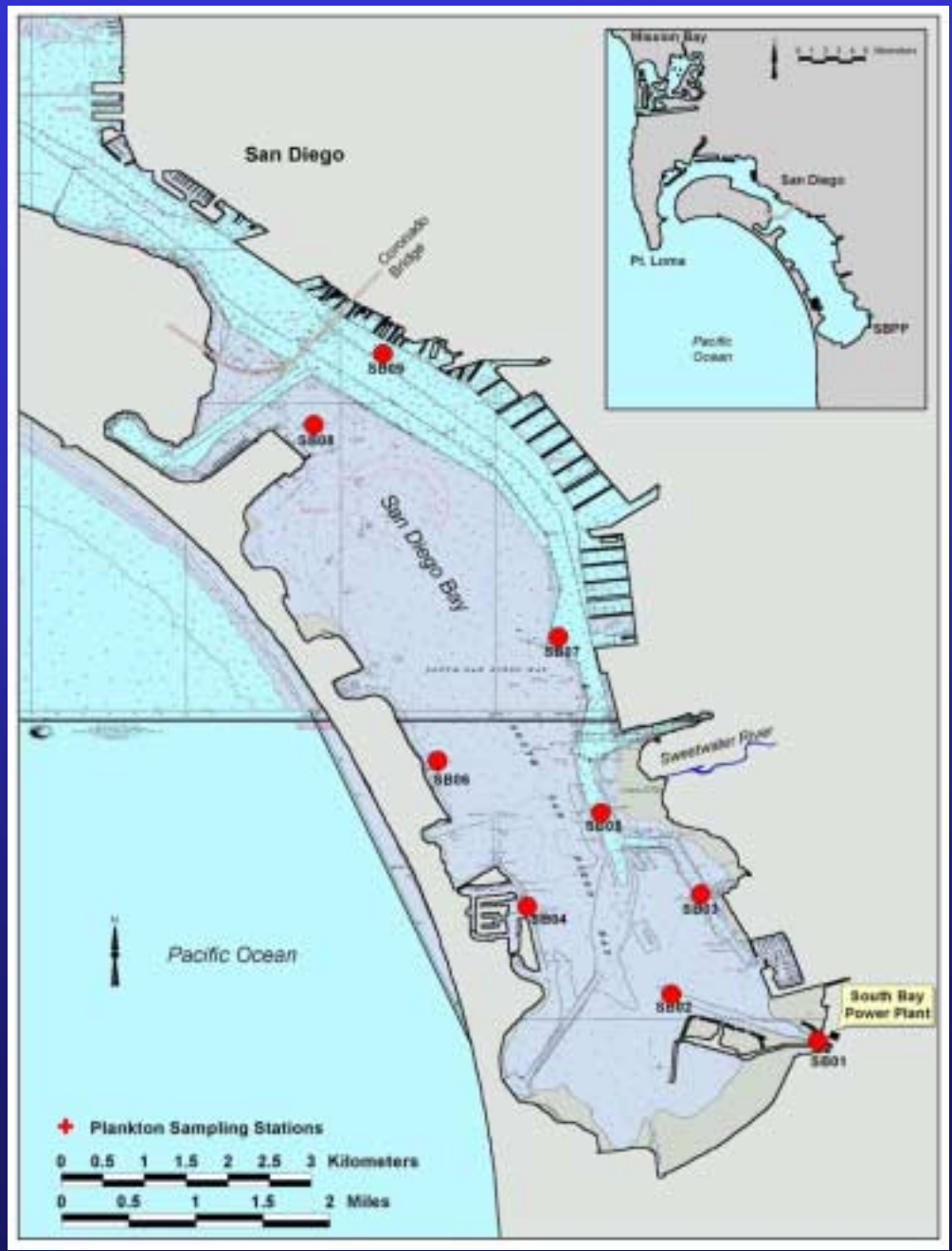


Entrainnment Survey Methods:

- Net tow samples from intake and source water collected monthly from Jan 2001-Jan 2002; and bi-monthly from Dec 2002-Oct 2003.
- Each survey extends over a 24-hr period to sample during range of tidal heights and day-night periods.



Ichthyoplankton Sampling:

- **Total 60 samples collected per survey.**
- **Station distribution: one (1) intake station, four (4) shallow stations, and four (4) channel stations.**

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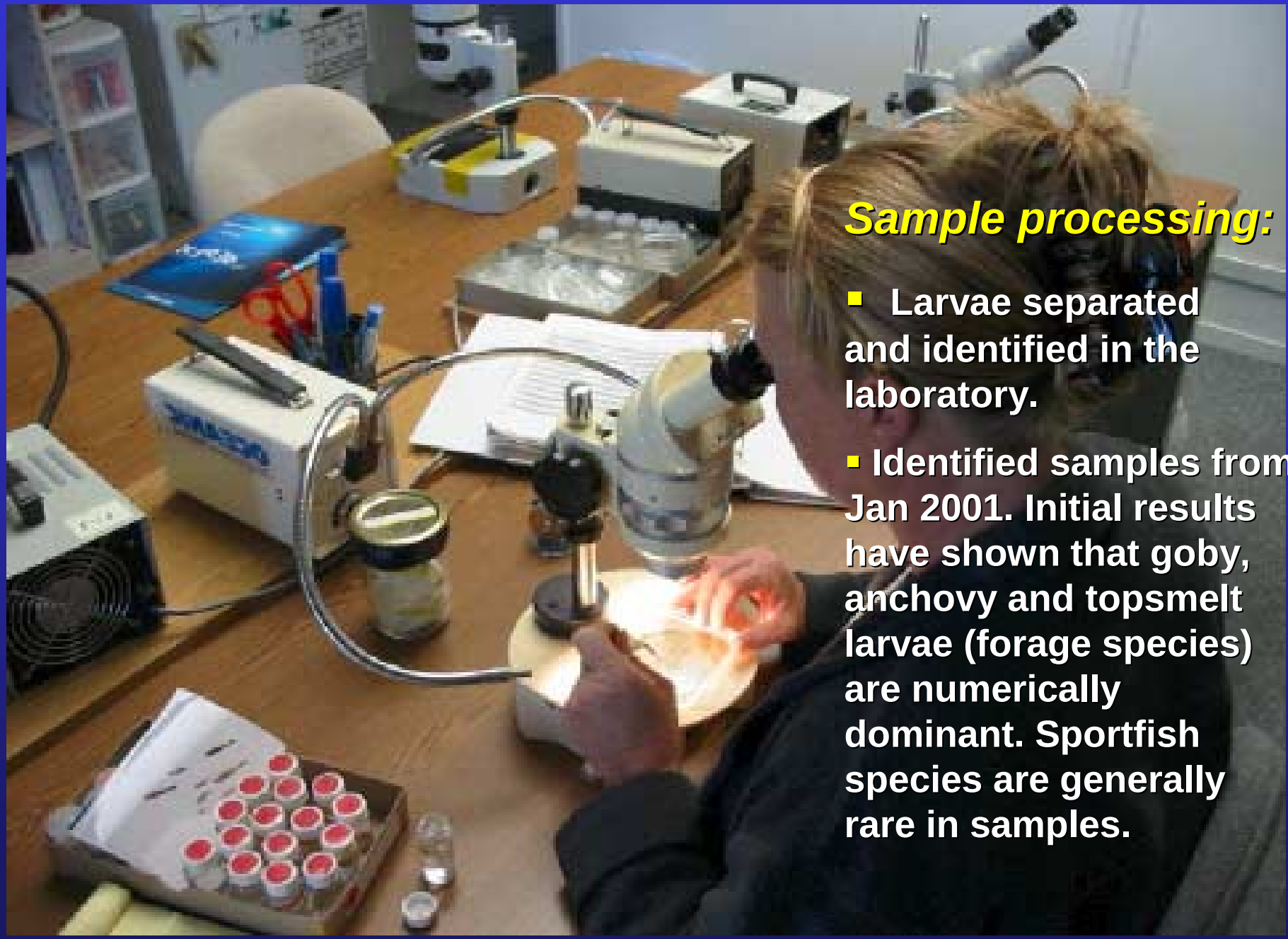

Sample processing:

- Larvae separated and identified in the laboratory.
- Identified samples from Jan 2001. Initial results have shown that goby, anchovy and topsmelt larvae (forage species) are numerically dominant. Sportfish species are generally rare in samples.

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Impingement Studies

Purpose:

Measure the abundance and biomass of fishes, macroinvertebrates and plant debris collected by SBPP CWIS screens.

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SBPP cooling water intakes, discharge area and impingement sampling location - overview

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Impingement Survey Methods:

- Weekly sampling began in Dec 2002 and will go through Nov 2003.
- Collection and processing of all impinged material over a continuous 24-hr period.
- Divided into six 4-hr cycles, with the traveling screens rinsed of all impinged material during each cycle .

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Best Technology Available Assessment

- Compare entrainment and impingement to source water populations.
- Assess Best Technology Available (BTA) to reduce CWIS entrainment and impingement.

Tasks scheduled for July, August, September 2003 (8 SEP 03)

- Receiving water temperature monitoring:
  - Deployed 10 intertidal and 21 subtidal arrays that record temps at surface, midwater, and bottom every 5 minutes.
- Intertidal and subtidal benthic faunal sampling:
  - Completed 2 out of 3 surveys (31 stations X 3 reps).
- Hydrographic studies:
  - Completed fine scale bathymetric survey
  - Measured current velocities in discharge field
- Weekly impingement surveys
  - Completed 42 out of 48 surveys
- Bi-monthly Entrainment and Source Water Ichthyoplankton
  - Completed 5 of 6 surveys, sorted 14 of 19, ID 10 of 19
- Dissolved oxygen and fish surveys
  - Completed 1 of 3
- Turbidity and eelgrass surveys
  - Ongoing

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Study Boundaries

- Field studies of the SBPP discharge are designed to infer interactions from biological patterns in the receiving water.
- Natural variation in populations and their environmental conditions bound our ability to detect these patterns in the field.
- Biological effects (if any) at or below the NPDES permit concentration limits can only be evaluated under controlled laboratory conditions.

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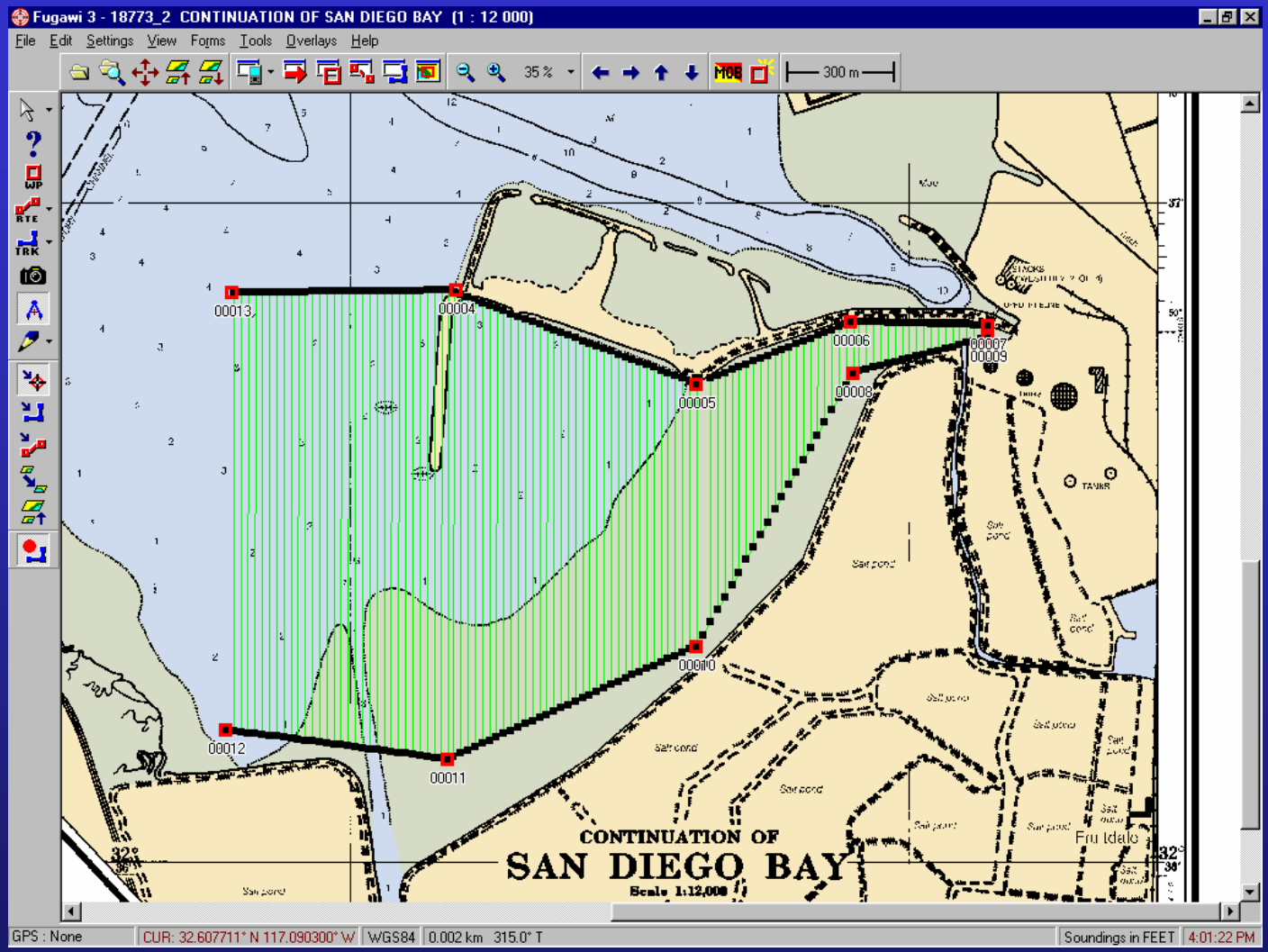

Area of fine scale bathymetry and ADCP* current studies

*acoustic Doppler current profiler

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